

Amendment and Remarks. Further details of the interview will be set forth in the appropriate sections of the remarks below.

In response to the Office Action mailed October 7, 1991, the applicants request reconsideration in view of the amendment and the following remarks.

Support for amended claims 1 and 9 can be found in the original claims 1 and 9 respectively. Claims 1 and 9 have been amended as suggested by the Examiner. In order to expedite prosecution, applicants have cancelled formulas III, IV, V, and VI in claim 1. The applicants have corrected the spelling of the word "substituents" as suggested by the Examiner. The applicants have cancelled claims 2,3,4 and 6 because they were dependent from the cancelled formulas of claim 1. The applicants have cancelled formula IV from claim 9. In addition, the applicants have corrected the misspelling of the word "from" in formula II of claim 9, and have made some punctuation corrections. Claims 25-31 and 42 have been cancelled because they were dependent on the cancelled formula IV of claim 9. Support for newly added claim 43 can be found in original claims 1, 3, 4 and 6. The subject matter of claims 3, 4, and 6 were indicated as allowable over the prior art. These claims have been incorporated into independent claim 43.

Claims 1, 5, 7-24, 32-41 and 43 are now in the case. Claims 1 and 9 have been amended. Claim 43 has been added.

The Examiner rejected claims 1-42 as being based upon a defective reissue declaration under 35 U.S.C. §251. Claims 1, 8-14, 18-20, 24-26, 32-34, 38-39, and 41-42 were rejected under 35 U.S.C. §112, first and second paragraphs. Claims 1, 2, 8 and 9 were rejected under 35 U.S.C. §102(b) and (g) as anticipated by or, in the alternative, as obvious under 35 U.S.C. §103 over Shepard '506. Claim 1 was rejected under 35 U.S.C. §102 as anticipated by, or, in the alternative, as obvious under 35 U.S.C. §103 over Kulakova. Claims 1, 8 and 9 were rejected under 35 U.S.C. §102(b) as anticipated by, or, in the alternative, as obvious under 35 U.S.C. §103 over Baranauckas et al. Claims 1, 8-11, 24 and 32-33 were rejected under 35 U.S.C. §102(b) and (g) as anticipated by, or, in the alternative, as obvious under 35 U.S.C. §103 over Spivak '207. Claim 1 was rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, as obvious under 35 U.S.C. §103 over Spivak '855. Claims 1-3, 6 and 8-42 were rejected under 35 U.S.C. §103 as being unpatentable over Spivak '207 in view of Razumova, Kulakova, Schmutzler, Ivanova and Shepard. Claims 1-42 were also rejected under the judicially created doctrine of obviousness-type double patenting in view of claims 1-14 of U.S. Patent No. 4,867,907. The applicants respectfully traverse these rejections.

**DECLARATION REJECTIONS**

The Examiner stated on page two, paragraph two, of the Office Action that the reissue oath or declaration is defective because it fails to particularly specify how the errors relied upon arose or occurred. The applicants respectfully disagree. The declarations filed by Dr. Burton and J.D. Odenweller fully specify the errors and how they occurred. Nevertheless, applicants are amenable to providing the additional information requested by the Examiner, and additional declarations are being submitted herewith. With respect to this rejection, at the interview, applicants' attorneys showed the Examiner a draft declaration of E.E. Spielman, and asked if that would be responsive to the matter of the European Search Report raised in the rejection. The Examiner indicated that the draft declaration provided the type of additional information that was deemed necessary, but indicated that applicants should also file the declarations of W.G. Montgomery and Patricia Hogan to have their statements made of record as to the matter of the European Search Report. Those declarations are being filed herewith.

The Examiner stated on page two, paragraph three, of the Office Action that Paragraph 8 appears inconsistent with the "reviewed and understand the contents" language of the typical

inventor's oath or declaration. During the interview, applicants showed the inventor's oath in the original case, and agreed that the original oath contained the subject language. The original declaration is attached hereto as Attachment C. However, the applicants respectfully disagree, as they disagreed at the interview, that par.8 of Dr. Burton's declaration is inconsistent with the oath. Burton states he reviewed and understood the specification and claims. In fact Dr. Burton did review the specification and claims and had made changes to the specification and claims before executing the oath. The errors which are the subject of the present application for reissue are not inconsistent with that oath, as explained in Dr. Burton's declaration. Specifically, with respect to the amendments made in view of the prior art, Dr. Burton is neither an attorney nor patent agent and as such, is not expected to know whether the claim language reads around the prior art. Dr. Burton disclosed all the prior art of which he was aware to his attorney and it is the responsibility of the attorney, not the inventor, to make certain that the proposed claims comply with the statutory requirements of patentability. Dr. Burton stated he understood the claims. Mr. Odenweller explained in his declaration how he misunderstood the nature of what Dr. Burton had told him, and, thus, failed to appreciate the prior art and to cite it to the Examiner. With respect to the

deletion in the specification of the Br reactant, Dr. Burton explained that he believed that the Br reactant would work, and that it was only after the patent issued that he obtained the information that it was not the case. (See also below). The remaining specified errors of the reissue application are now moot in view of the instant amendments to claims 1 and 9, but, to complete the record, will be discussed below.

The Examiner stated on page two, par. four of the Office Action that paragraphs 9 and 12 do not state the circumstances, date, when/how applicant discovered the inoperability. The Examiner further stated on page two, paragraph six of the Office Action that paragraph 18 does not recite how and when applicant discovered  $\text{PBr}_3$  "does not appear to work". As explained during the interview, the answer to the Examiner's questions is that after Dr. Burton left the employment of assignee, Ethyl, others in the company carried out various experiments in which that inoperability was determined, and that was then made known to Dr. Burton shortly before the application for Reissue was filed. The Examiner indicated that the information should be made of record, and then would be considered. Filed herewith is the declaration of Dr. Vincent Gatto. Dr. Gatto states that no prior work with  $\text{PBr}_3$  was done at Ethyl prior to April 1991, and then identifies the experiments in which he attempted to utilize  $\text{PBr}_3$  in April 1991.

Dr. Burton's declaration already provides that he had been unaware of any errors until April 2, 1991, when he met with counsel and the initial errors were first identified (par.5). Further, at par.18, he points out that he had not known of any errors at the time of the filing of the original application. In summary, as reported by counsel at the interview, Dr. Burton became aware of the inoperability of PBr as a reactant as a result of the work at Ethyl in April 1991, and that was the basis of the correction requested in the instant application.

The Examiner questions at page two, par. five, how the missing "O" in claim 26 came about, and whether it was in the original claim. Claim 26 is now cancelled. However, the circumstances of that error are nevertheless set forth here. During the interview, applicants showed the Examiner copies of the documents attached hereto as Attachment D. Attachment D constitutes the relevant portion of the draft specification and claims which were reviewed and corrected by Dr. Burton. As is apparent, the draft contained the "O" in the formula. The "O" is also present in the formulas reproduced in the specification. It appears that the "O" was inadvertently missed when the draft claims were typed. It is understandable that Dr. Burton would have overlooked the missing "O" when reviewing the specification and claims, because having reviewed the claims and the specification before, he undoubtedly

expected the formulas to be accurate and expected to see the "O". As sometimes happens with lengthy formulas, one "sees" what one expects to be there. The missing "O" was discovered by counsel during the review of the claims, and was shown by counsel to Dr. Burton on April 2, 1991. Dr. Burton confirmed that the "O" was missing and should have been and was intended to be in the formula (decl. par. 16).

The Examiner stated on page two, paragraph seven of the Office Action that "Odenweller declaration par. 10, states lack of awareness of the EP search report", and that Shepard was known in another application, serial number 110,181 (as shown in the Odenweller declaration). The Examiner appears to be concerned about the possibility that applicants may have knowingly withheld prior art while letting the patent issue. As stated by applicants during the interview, in fact, there was no inequitable conduct, and no withholding of known prior art.

The inventor was not aware of any of the prior art in issue (decl. par. 10).

As to the Shepard patent, the Examiner will appreciate that each serial number has its own file wrapper associated with it. Mr. Odenweller discovered the Shepard reference in connection with the SN 110,181 application and dutifully cited it to the PTO (see Odenweller declaration at par.

11), because both Shepard and the '181 application are directed to a process for making cyclic aryl chlorophosphites. That, however, is not the subject matter of the instant application. It is easy to understand and appreciate why Mr. Odenweller recognized and cited the connection between the '181 application and Shepard, but would not have made the connection between Shepard and the instant application. It is also immediately apparent that Shepard's only possible connection to the instant application is the single reference to a "phosphorus trifluoride" as a potential alternative ingredient to  $\text{PCl}_3$  in a reaction with phenol in the making of Shepard's compounds, a point that can be very easily overlooked. Mr. Odenweller stated in his declaration that he did not make any connection between Shepard and the instant application, and, in light of the obscure nature of the single fluoro reference in Shepard, it is easy to understand why a busy attorney working on a different case and invention would not see any connection. Any suggestion that Mr. Odenweller acted inequitably is fully refuted by Mr. Odenweller's citation of the reference in the '181 application, where it was clearly pertinent, and the assignee's prompt disclosure of the reference in this reissue application.

With respect to the EP Search Report, it was received but was simply filed without any consideration. Ms. Hogan, who received the EP search report, at the time had no



substantive responsibility with respect to the U.S. application. The EP search report was reviewed only after an office action became due in the EPO. Again, as soon as the report was reviewed and the pertinency of the references noted, the assignee made an investigation and cited the references and the pertinent circumstances of the EP report in this proceeding. How the EP report was discovered is detailed in the Declarations of Edgar Spielman and Patricia Hogan which are being concurrently filed. The inventor, Dr. Burton, first became aware of the references in April 1991, as shown in his declaration. That is when Dr. Burton was contacted by Ethyl's outside counsel with respect to the above discoveries and the suggestion that an application for reissue was in order. (For the record, a "y" reference is not "an (almost) anticipation" or, for that matter, an obvious reference. The definition of a "y" reference is "document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art". The Examiner is describing an "X" reference, which can be an (almost) anticipation. The definition of an "X" reference is a "document of particular relevance: the claimed invention cannot be considered to be novel or involve an inventive step".

Also enclosed is an affidavit from Mr. Montgomery, which further explains that the EP Search Report was not reviewed or considered at the time that it was received.

Finally, the Examiner refers to "imputing" knowledge to an assignee. That reference is not understood. Nothing in the patent laws, regulations or MPEP refers to "imputing" knowledge or for taking action based on such "imputation".

In short, errors occurred in the handling of the original application for Dr. Burton's invention. The attorney responsible for prosecuting the application misunderstood Dr. Burton's disclosure of the prior art to him, and the attorneys failed to review or consider the EP Search Report when it was initially received. The errors were without deceptive intent, however, and that is clearly evident in the fact that the inventor and assignee filed the instant application to reissue the patent a year after it issued in which all the prior art and circumstances were detailed. The applicants took this action voluntarily, and not because of any foreseeable litigation. Applicants clearly would not have intentionally withheld known prior art only to then go through the trouble and cost of filing a reissue application shortly thereafter.

Applicants have made a very valuable invention in discovering a class of fluorophosphite phenolic antioxidants. The

reissue statute was designed to respond to errors without deceptive intent as here demonstrated.

For the above reasons, the Examiner's rejection of the application based on a defective reissue declaration is traversed. The reissue declaration fully complied with 37 C.F.R. 1.175, and, specifically, the reissue declaration and the other corroborating declarations of others specified the errors relied upon, and how they arose or occurred. We trust that the above additional information requested by Examiner will satisfy the Examiner's questions.

**§112 REJECTION**

(1 and 2) Claims 1, 8-13, 18-19, 24-26, 32-34, 38 and 42 are rejected under 35 U.S.C. §112, first paragraph because the Examiner states that no enabling teaching "how to make" products having a free hydroxyl is described in the instant specification.

In order to expedite the prosecution, the applicants have amended the claims to delete the references to the specific fluorophosphorous compounds containing free phenolic -OH by cancelling formula IV from claims 1 and 9.

Applicants, however, will note that there is nothing in the teachings of the applicant's application or reissue application to contradict what one skilled in any chemical art

would be bound to know -- one could not cause all of the phenolic OH groups of a phenol to react with  $\text{PCl}_3$  unless one used enough  $\text{PCl}_3$  to react with all of the OH groups. Thus, one skilled in the art would certainly know that one way of making sure that one's product would contain free phenolic OH would be to use insufficient  $\text{PCl}_3$  to react with all phenolic OH groups in one's starting material.

It should also be noted that the third and fourth equations in column 15 of the reissue application show that the starting phenol can be reacted with an organophosphorus dichloride instead of  $\text{PCl}_3$  and the fourth equation could be particularly valuable in showing that a phenol containing  $r + s$  OH groups is reacted with only  $r$  molecules of  $\text{R}'\text{PCl}_2$  (or, by implication,  $\text{PCl}_3$ ) when it is desired to leave OH groups unreacted.

(3 and 4) The Examiner questioned whether claim 9 which is not dependent on claim 1 was intended to recite the "new definition of 'A'" added to claim 1. Also, the Examiner questioned in page 4 paragraph 4 whether graphite or coal was intended to be encompassed by "polynuclear A" in claims 9-11, 25, 33, 42. The applicants have amended claims 1 and 9 by deleting formula IV, which is the only formula containing the definition of "A". The applicants have also cancelled claims 25-31 and 42 which are dependent on formula IV. Therefore, the rejection is moot.

(5) The Examiner questioned whether the word "substituent" singular, or plural was intended. The applicants have amended the word "substituent" to "substituents" since the plural was obviously intended.

(6) Claims 1, 8-13, 18, 19, 24-26, 32-34, 38 and 42 were rejected because the Examiner questioned how halogens survive the reaction with "fluorinating agent" without being displaced by fluorine. A non-F halo substituent would be displaced by F only if one wanted it to be displaced. In the fluorination reactions, the halogen attached to the phosphorus atom is so much more easily displaced than any halo on the ring that there would be no problem in preventing transhalogenation at the ring position. Also, although the fluorinating agent could be the  $\text{SbF}_3$  mentioned by the Examiner, it certainly is not the only fluorinating agent that could be used in preparing the compounds; and those skilled in the art could be expected to have enough sense to use another fluorinating agent when they wanted to keep a non-F halo substituent on the ring.

(7) Claims 1, 8-14, 18-20, 24-26, 32-34, 38, 39, 41 and 42 were rejected because of the indefiniteness of "aryl". "Aryl" as in Hackh's Chemical Dictionary, Third Edition, is defined as an "organic radical derived from an aromatic hydrocarbon by the removal of one hydrogen atom" and there is nothing indefinite about

the use of the term, since the specification does not contradict the usual interpretation and, in fact, uses the same terminology.

(8) This ground of rejection also relates to "aryl" but apparently applies only to the aryl substituents, since the substituents were the only aryls limited in carbon number. There is nothing indefinite in the use of the term "aryl" to define the substituents. The term was used in the specification and in the claims in the conventional manner, as defined by Hackh's, and would cause no confusion to those skilled in the art.

The examples of aryl substituents containing 6-12 carbons are given in column 2, lines 23-24, as phenyl, o-tolyl, naphthyl, 4-phenylphenyl, and 4-sec-hexylphenyl. These exemplifications demonstrate that there is no criticality regarding a simple benzene ring vs. a condensed ring or regarding the type of substituent on the ring, and that the reference to an aryl substituent containing any given number of carbons was not intended to be limited to only one particular aryl substituent containing that number of carbons (except for the aryl substituent containing six carbons, of course). Both 4-phenylphenyl and 4-sec-hexylphenyl contain 12 carbons.

Those skilled in the art are certainly sufficiently aware of the various aryl substituents containing 6-12 carbons to understand the terminology, and there was surely no need to

exemplify every group that could be covered. Regarding the cyclooctatriene mentioned by the Examiner, it is not believed to be an aryl.

(9) Claim 32 was rejected as being improperly dependent on claim 8. The Examiner apparently believes that deleting "containing" from claim 8 makes the language exclude the presence of unrecited materials. Applicants do not agree that the language of amended claim 8 excludes the presence of additional materials such as the phenolic antioxidant of claim 32.

(10) The Examiner rejected claim 1 because of the newly inserted A structures. The applicants have cancelled formula IV and the structures of "A" are no longer in the claim.

(11) The Examiner has requested the literature cited in the first paragraph of column 16. The applicants have enclosed the copies of that literature and are submitting it to the Examiner.

**SHEPARD '506 REJECTION**

The Examiner has rejected claims 1, 2, 8, and 9 under 35 U.S.C. § 102 (b and g) as anticipated by or, in the alternative, under 35 U.S.C. §103 as obvious over Shepard '506. The applicants traverse this rejection.

Shepard discloses a compound and a process for preparing the same (see column 1 lines 10-11). Applicants's amendment to claim 1 and cancellation of claim 2 moots that part of the rejection. With respect to claims 8 and 9, they are drawn to a combination composition of a recited antioxidant and an organic material susceptible to gradual oxidative degradation, with the organic material having incorporated therein the recited antioxidant by mixing or spraying. Shepard does not teach nor disclose such a combination composition, and nowhere suggests that any phosphoro-halide compound would be useful as an anti-oxidant. Shepard discloses only that the "secondary aryl phosphites of this invention may be used as antioxidants" (column 1 lines 31 through 32). Shepard then at column 1, lines 56 through lines 62 discloses that these antioxidants can be made via a phosphoro-halide intermediate:

It has been found that by reacting phenols substituted in at least two of their positions with organic radicals containing at least four carbons atoms, with a phosphorus trihalide, under conditions which facilitate removal of halogen acid, a secondary aryl phosphoro-halidite is obtained which is then hydrolyzed to a stable secondary aryl phosphite. (emphasis added)

The secondary aryl phosphoro-halidite is simply and only disclosed as an intermediate in the formation of the secondary



aryl phosphite, which is the antioxidant. Indeed, Shepard '506 states at col.4, lines 66-67 that "Note should be made of the fact that the phosphorochlorodites are very stable intermediates". There is no suggestion or disclosure of the phosphoro-halidite as an antioxidant and absolutely no suggestion that the phosphoro-halidite be combined with an organic material. This reference does not anticipate and does not render obvious claims 8 and 9 of this application.

In In Re Lalu, 747 F.2d 703, 223 USPQ 1257 (Fed.Cir. 1984), it was held that the presence in the prior art of a compound whose only disclosed usefulness is as an intermediate to make other compounds does not form a basis for prima facie obviousness of homologous compounds. The Court held:

The mere fact that [the prior art] can be used as intermediates...does not provide adequate motivation for one of ordinary skill in the art to stop the...synthesis and investigate the intermediate...with the expectation of arriving at appellants' claimed [invention].

Here, the mere fact that Shepard disclosed a halogen-containing compound as an intermediate in the formation of a non-halogen-containing material as an antioxidant is irrelevant to any invention using those halogen-materials as antioxidants per se. Whatever the limits of In Re Lalu, that decision is squarely contrary to any rejection of claims directed to an antioxidant

composition based on prior art merely showing a reactive intermediate for making another and different type of antioxidant. Moreover, it takes yet another quantum jump to find any suggestion or motivation in Shepard to use a fluoro-containing material as an antioxidant, when no specific fluorophosphonite is even disclosed in the reference, much less as an antioxidant.

The Examiner states that Shepard discloses the subgenus of the applicants' formula V, but the Examiner noted during the interview held on January 28, 1992, that he meant claim 1 formula VI instead of formula V. (The applicants' formula V is  $(RO-)P(-F)_2$  which permits one (RO) group while Shepard discloses two (RO) groups). In order to expedite prosecution, the applicants have cancelled formula VI from claim 1. However, applicants traverse the Examiner's rejection. Shepard is different because the applicants' formula VI requires a fluorine to be present. ALL of Shepards' examples only disclose the use of chlorine or -OH. Shepard has not enabled one of ordinary skill in the art to use any halide other than chlorine. Not all halogens work equally, and, specifically, given that Shepard's sole purpose of making the phosphoro-halidite was to hydrolyze it, there would be no motivation to make a phosphoro -F analog. This is particularly true in view of the declaration from Dr. Gatto showing that fluorophospho-

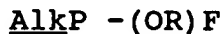
nites are much more hydrolytically stable than the chlorophosphonite.

For the above reasons the rejection of the claims based on Shepard '506 should be withdrawn.

**KULAKOVA REJECTION**

Claim 1 is rejected under 35 U.S.C. § 102(b) as anticipated by, or, in the alternative, under 35 U.S.C. § 103 as obvious over, Kulakova.

Kulakova discloses compounds that are represented by the following general formula

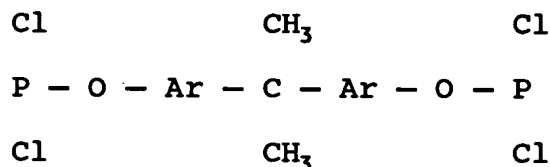


(see Table 1, page 548). As the Examiner has correctly noted, this reference does not teach an antioxidant. None of the applicants' formulas consist of (OR)PF except for formula III. However, in the applicants formula III, R must be a substituted or unsubstituted aryl, while Kulakova does not teach nor disclose "R" as aryl. However, in order to expedite prosecution, the applicants have cancelled formula III from claim 1. Therefore, this reference is no longer applicable.

**BARANAUCKAS REJECTION**

Claims 1, 8, and 9 are rejected under 35 U.S.C. § 102(b) anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Baranauckas et. al. (Baranauckas).

Baranauckas discloses compounds that are represented by the following very specific formula:



(see column 1 lines 16 through 22). The Examiner states that the reference suggests that the Cl atom on the phosphorous may be another halogen. There are a number of significant differences between Baranauckas and the applicants' claimed invention.

With respect to the claim 1 rejection, it is moot in view of the amendment to claim 1 for reasons previously stated. With respect to claim 9, none of the antioxidants recited in claim 9 correspond to the Baranauckas formula, even were it to be assumed that the Cl in the Baranauckas formula could be substituted with F. With respect to claim 8, the Examiner relies on In Re Baranauckas, 108 USPQ 413 (CCPA 1956) for the rejection. The applicants respectfully traverse that rejection. Baranauckas does not identify, specify or suggest any F-containing material. In Re Baranauckas is not in point. There, the CCPA specifically noted

that the only difference between the prior art and the claimed invention was the substitution of a chloro for a bromo substituent, when the prior art specifically disclosed that "chlorine and bromine behave in the same way". 108 USPQ at 228. Further, the CCPA noted that the prior art taught that all the halogens will perform in the same way. Id. Finally, the CCPA stated:

[T]hough our decision is compelled by the existing law, we feel constrained to point out that there are limits to the doctrine of those cases. What the precise boundary lines are, we are unable now to discern. Certainly they do not extend so far as to permit publication of theoretical lists of hundreds or thousands of possible compounds to deny patent protection on such compounds to those who have actually discovered them later. The exact boundaries will have to be delineated on a case by case basis.

Whether Baranauckas can be deemed an anticipation of claim 8 when no F-containing compound is actually disclosed in the reference invokes issues of (1) the evidence of lack of novelty and (2) of enablement.

As to the first issue, Baranauckas suggests two utilities for his compounds -- a PVC stabilizer and a fire retardant in resins. In PVC, the main degradation is caused by the loss of HCl, which then produces conjugated bonds which are chromophores. The HCl is self-propagating. So, stabilizers are

added to PVC to abstract the HCl. None of the prior art references suggests that if F replaced Cl in the Baranauckas compounds that the HCl scavenging properties would be maintained. Nor is there any evidence that such a substitution would impart flame-retardancy. To the contrary, the prior art suggests that opposite -- that Cl and F- containing compounds do not behave the same way in the intended use. Thus, enclosed is Attachment E, an excerpt from the Encyclopedia of Polymer Science and Engineering (2d Ed), Vol. 7 at 184-93 (1987). There it is stated (at p. 186):

Whether the principal flame-inhibition mechanism of organohalogen compounds is physical or chemical should not obscure the fact that they are effective flame retardants. Molar efficiency decreases in the following order: I > BR > Cl > F (36,50,144,155). The low efficiency of fluorine compounds has been attributed to the stability of the C-F and H-F bonds.

Thus, directly contrary to the rationale in In Re Baranauckas, the prior art provides specifically that in the intended environment Cl, F and the other halogens are not the same. Moreover, not only do the halogens not behave the same, but F is noted as the least effective (if at all effective) as a flame retardant. Any person of ordinary skill in the art would read the "halogen" disclosure as referring and motivating the use of a prior-art recognized superior halogen, Br, not a purposefully defective F analog. Moreover, as

also noted in the formulas on p. 186 of the reference, the halogens form H-Hal in the environment. Would any person of ordinary skill in the art add a compound into a polymer in the large quantities required of a flame retardant (5% to 15% of the total composition as set forth in the Examples of the Baranauckas reference), which would produce HF in case of fire? Perhaps a new saying would be required -- "jumping from a fire to a gas chamber". No person of any skill or sense would place that high a quantity of material designed to produce HF into any plastic material. (The present invention involves use of approximately 0.05% wt.% of the novel antioxidant in the polymer composition. See Examples 7-9 of the specification).

The Baranauckas reference is totally silent in any suggestion that substitution of another halogen for Cl, much less F, would maintain the desired properties of the Baranauckas compounds. Thus, the basis of the In Re Baranauckas case is missing in the Baranauckas reference, and for that reason alone, the rejection should, respectively, be withdrawn.

There is also no evidence of enablement, i.e., any suggestion that Baranackaus taught how to make F- analogs of the specific compounds of the Baranauckas formula, or that it was within the prior art to do so. Baranauckas teaches that his disclosed compounds can be made by reacting his specific phenolic

compound with  $\text{PCl}_3$ , where the Cl may be replaced with another halogen. But, as demonstrated in the concurrently-filed Declaration by Dr. Vincent Gatto, there is no evidence that any phenolic compound would react with  $\text{PF}_3$  and proof that  $\text{PBr}_3$  does not work.  $\text{PF}_3$  is unreactive, and that is the reason the instant patent teaches that the instantly-claimed compounds are made by reacting phenolic compounds with  $\text{PCl}_3$  to form a chloro-compound, and that this is then followed by reacting that intermediate with  $\text{KF}$ , for example, to make the desired materials. Thus, Baranauckas is a false reference, which, if anything would mislead a reader to a dead-end. It does not disclose to a person of ordinary skill in the art any fluoro-phosphorus compound.

Finally, there are substantial differences between a  $\text{PCl}$  and a  $\text{PF}$ - containing material as an antioxidant. Enclosed is a declaration from Dr. Gatto showing unexpected superior results of fluorine over chlorine. Fluorophosphonite is much more hydrolytically stable than the chlorophosphonite. These experiments further demonstrate that, as a practical matter, the chlorophosphonite analog is too unstable hydrolytically to be suitable for use as a polymer antioxidant and furthermore it can liberate hydrogen chloride gas which can cause corrosion to the processing equipment.

In order to expedite prosecution the applicants have cancelled formula VI from claim 1. With that, and in view of the



above remarks, the rejection based on Baranauckas should be withdrawn.

**SPIVAK '207 REJECTION**

Claims 1, 8-11, 24, and 32-33 are rejected under 35 U.S.C. § 102(b and g) as anticipated by, or, in the alternative, under 35 U.S.C. § 103 as obvious over Spivak '207.

According to the Examiner, Spivak '207 relates to claim 1 formula III of the applicants claimed invention. However, in order to expedite prosecution the applicants have cancelled formula III from claim 1, and, therefore, the rejection is moot.

With respect to claims 8-11, 24, 32-33, there are significant differences between Spivak '207 and the applicant's claimed invention. Spivak specifically defines his halogens: "R<sup>5</sup> is halogen such as chlorine and bromine, preferably chlorine" (see column 3 lines 65 through 68). All the working examples disclose the use of chlorine. The applicants' claimed invention must be with fluorine and not chlorine. In In Re Taborsky, 502 F.2d 775, 781, 183 USPQ 50 (CCPA 1974), the court stated:

"Schraufstatter expressly limits the scope of 'halogen' in the definition of his genus to 'chlorine, bromine, and iodine.' Thus, appellant's fluoro-substituted compounds are outside Schraufstatter's genus as well as Schraufstatter's sub-genus. ... In short, the prior art of re-

cord provides one of ordinary skill in the art with no motivation to make the proposed molecular modifications needed to arrive at appellant's claimed fluoro-substituted compounds. (emphasis added)

There is no substantial difference between the disclosure of "halogens" in In Re Taborsky, as compared to the instant case. Therefore, In Re Taborsky controls on this issue, and it can not be concluded that Fluorine is a member of the scope of "halogens" in the definition of the genus of Spivak.

There is also, again, no motivation or suggestion in Spivak to use F instead of the named halogens Cl and Br. There is also no enablement on how to make any F-containing compounds.

Moreover, even were a fluorophosphite compound embraced by Spivak -- which it is not -- Spivak covers millions of possible compounds. The previously-cited quote from In Re Baranauckas applies here -- disclosure of millions of theoretical compounds does not "deny patent protection on such compounds to those who actually discovery them later". (108 USPQ at 228). Nothing in Spivak anticipates or renders obvious the use of fluorophosphite phenolic compounds as antioxidants, and, certainly nothing comes close to specifically motivating a person skilled in the art to make the compounds of the specific formulas of claim 9.

The previously cited declaration from Dr. Gatto demonstrates that fluorophosphonite is much more hydrolytically

stable than the chlorophosphonite. These experiments further demonstrate that, as a practical matter, the chlorophosphonite analog is too unstable hydrolytically to be suitable for use as a polymer antioxidant and furthermore it can liberate hydrogen chloride gas which can cause corrosion to the processing equipment.

Therefore, in view of the amendment and the above facts, the rejection based on Spivak '207 should be withdrawn.

**SPIVAK '855 REJECTION**

Claim 1 is rejected under 35 U.S.C. § 102(b) as anticipated by, or, in the alternative, under 35 U.S.C. § 103 as obvious over, Spivak '855. The Examiner states that Spivak '855 relates to applicants formulas V and VI of claim 1. In view of the deletion of those formulas from claim 1 for previously stated reasons, this rejection should be withdrawn.

**KIM REJECTION**

Claims 1 is rejected under 35 U.S.C. § 102(b) as anticipated by, or, in the alternative, under 35 U.S.C. § 103 as obvious over, Kim USSR. The Examiner specifically applied Kim to Claim 1 formulas III, V and VI.

Kim does not relate at all to the applicants' formula

II, and the Examiner did not apply it. In view of the amendments to claim 1 for previously stated reasons, this rejection should be withdrawn.

### §103 REJECTION

Claims 1-3, 6, 8-42 are rejected under 35 U.S.C. §103 as being unpatentable over Spivak '207 in view of Razumova, Kulakova, Schmutzler, Ivanova, and Shepard. The same arguments as presented above apply to Spivak '207, Kulakova, and Shepard.

Razumova does not disclose or teach the applicants' formulas. Razumova requires that the phosphorus be bonded to two oxygens in a five membered ring. The five membered ring is adjoined to a substituted phenol ring. This ring is not present in the applicants invention. Formula II is the only possible formula of the applicant's that can be compared with Razumova. In applicants' Formula II, the phosphorus is bonded to two oxygens in a five membered ring with one fluorine. The ring also contains R<sup>1</sup> and R<sup>2</sup>. R<sup>1</sup> and R<sup>2</sup> are substituted or unsubstituted aryl groups wherein the substituents are selected from alkyl, aryl, aralkyl, cycloalkyl, hydroxy, alkoxy, aryloxy, and halo. This is not taught nor suggested by Razumova. Razumova is also not used as an antioxidant.

Schmutzler does not disclose nor teach the applicants' formulas, and certainly does not teach claim 1 formula II or the specific compounds of claim 43. Further, Schmutzler does not teach anything that could suggest or motivate anyone to use any of his compounds as an antioxidant.

Ivanova discloses a compound of the formula  $\text{ROPF}_2$  and  $(\text{RO})(\text{ArO})\text{PF}$ . The Examiner states that Ivanova, Table I and II, page 853 and Shepard render Spivak's suggestion enabling by providing the unsubstituted aryl compounds.

Ivanova again does not teach or suggest any compounds of the amended claim 1 or 43, and there is no suggestion or motivation for anyone to use Ivanova's disclosed compounds as an antioxidant in an organic composition.

None of the references taken alone or in combination renders the applicants' claimed compounds obvious and therefore this rejection should be withdrawn. Furthermore, there is absolutely no suggestion or motivation whatsoever disclosed in the prior art to spray or mix any fluoro-phosphorous compound as an antioxidant for organic materials. Dr. Burton, however, discovered for the first time that fluoro-phosphorous-phenolic compounds provide excellent and superior antioxidants. The materials are already commercialized and, upon FDA clearance for use in food-grade plastics (virtually all polyolefin producers demand FDA

certification), the invention will become a most significant entry into the antioxidant field. The inventor has ventured into previously uncharted and unknown areas and has made a valuable contribution and invention. There was nothing the prior art which could have motivated anyone to make the fluoro-phosphorus-phenolic antioxidants for spraying or mixing as antioxidants with organic compounds. It is not necessary to cite the many Board and Federal Circuit cases that make clear that the inventor in this case is entitled to the protection of the instant proposed claims as amended.

#### DOUBLE PATENTING

The Examiner rejected claims 8 through 42 under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-14 of U.S. patent no. 4,867,907 ('907). The applicants respectfully traverse this rejection. The '907 patent claims a hydrolytically stable aqueous phosphite antioxidant suspension, which is an improvement over the subject matter of the claims of the present application, and was filed after the present application. Nevertheless, because of the PTO procedures, it issued earlier in time. The rule in such cases is well summarized in 3 D. Chisum, Patents, §9.03[2](c)(1990) as follows:

An inventor may first file an application for a patent claiming a basic or generic invention and thereafter file a patent on an improvement on that basic invention. The broader basic patent may face greater difficulty in the Patent Office examination process with the result that a patent on the improvement issues first. The question then arises whether a second patent on the broader generic invention is barred by double patenting....

In resolving the problem, the courts reasoned in effect that the order of issuance should be disregarded in this special situation and the later issuing generic patent should be upheld if the improvement is patentably distinct from the generic invention. The effective period of monopoly is no more extended as to the improvement than if the improvement had issued after the generic patent.

The above analyses was specifically approved by the Federal Circuit In Re Braat, 19 USPQ 2d 1289, 1292 (Fed. Cir. 1991), and is also fully consistent with In Re Borah, 148 USPQ 213 (CCPA 1966). See also, In Re Kaplan, 229 USPQ 678 (Fed. Cir. 1986).

The claims of applicant's present application do not disclose adding a water soluble surfactant or water to the claimed compositions, and no basis is seen for treating the '907 patent claims as being patentably indistinct from the claims of the instant application. For the above reasons, the double patenting rejection should be withdrawn.

The above double patenting rejection was briefly mentioned during the interview, and the Examiner referred to In Re Bowers and Orr, 149 USPQ 570 (CCPA 1966), which the Examiner stated was more relevant than Borah, because Borah was a mechanical invention case, while Bowers and Orr was a chemical case. The Examiner is correct in noting the differing subject matters of the two cases, but the law on double patenting does not distinguish between the nature of the invention. Bowers and Orr is simply not in point. In that case, the applicants conceded that a double patenting rejection was appropriate and tried to avoid the rejection by a terminal disclaimer. The PTO refused to accept the terminal disclaimer, and the only issue on appeal to the CCPA was whether the terminal disclaimer should overcome the admitted double patenting. The issue here is whether there is a proper obviousness-type double patenting rejection, a matter not addressed in Bowers and Orr. That issue is, however, addressed in In Re Borah, In Re Bratt and Chisum, and the law is as there stated. That law controls here, and it requires that the '907 be treated as a subsequent invention. Thus treated, it is patentably distinct, and can not be a basis of a double patenting rejection.

The Examiner rejected claims 1-7 for the same judicially created doctrine of obviousness type double patenting over the same claims 1-14 of the '907 patent. The applicants



respectfully traverse this rejection for the same reasons as set forth above.

Lastly, with reference to Babillis Pat. No. 4,962,144, col.3 line 5 (filed December 30, 1988), the Examiner asked when the stated compound from Ethyl ( $C_{30}H_{44}PO_2F$ ) was on sale. The applicants did not offer, or place, this material on sale until AFTER they filed for the patent application. The regular business records of Ethyl indicate that the first samples of a covered material were sent by Ethyl on March 12, 1987, which is after the original application on February 27, 1987. During the interview, this information was presented to the Examiner, and applicants asked if counsel's representation would be sufficient on this point or if a declaration would be required. The Examiner indicated that counsel's representation would likely be sufficient.

Applicants are filing another copy of Odorisio "B" with this amendment.

A one month extension fee has been paid.

If there are any additional fees due in connection with the filing of this response, including any fees required for an additional extension of time under 37 C.F.R. §1.136, such an extension is requested and the Commissioner is authorized to charge or credit any overpayment to Deposit Account No. 03-2775.

Serial No. 07/714,441

AN 5585/RE

Based on the foregoing amendments and remarks,  
reconsideration of this application and its early allowance is  
earnestly solicited.

Respectfully submitted,

CONNOLLY AND HUTZ

BY Ashley I. Pezzner  
Ashley I. Pezzner  
Registration No. P 35,646  
Telephone: 302/658-9141

AIP/sms  
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